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eral more are extirpated; three are believed to be hybrids; five or six are known or believed to have been introduced; of about 375 remaining, 165 are popularly distinguished as water-birds and 210 are land-birds. Of these, 29 water-birds and 37 land-birds are accidental wanderers from various points of the compass, chiefly from the West and South; 30 more are of decided rarity, leaving about 280 species of somewhat regular occurrence, of which about three-sevenths are water-birds, a relatively large proportion due to the coastwise situation."

These 390 species and subspecies are arranged in systematic sequence following the A. O. U. Check-List implicitly, but adding a number of local or vernacular names. No attempt is made to give descriptions. Relative abundance and status, as well as the times of occurrence are given, and the place of occurrence is stated in the case of each species. The right hand page is left blank for annotations, so that the actual number of printed pages covered by the List is 38. An index covers about 8 pages, and the List closes with about six double pages of "Seasonal Charts," indicating by lines and dashes the actual times of the year when each species is present. This chart is also arranged systematically as to the names of the birds. While there would be some obvious advantages in a chronological arrangement of the species, in the order of their spring migrations, the disadvantage of not knowing where to look for any given species would be great. The print and paper are excellent. The List should prove of great value to students of birds in the region which it covers.

L. J.

Birds in Relation to a Grasshopper Outbreak in California. By Harold C. Bryant. University of California Publications in Zoölogy, Vol. 11, No. 1, pp. 1-20. November 1, 1912.

"An investigation into the relation of birds to a grasshopper outbreak was carried on at Los Banos, Merced County, California, July 11 to 17, 1912.

"Grasshoppers were found to be causing considerable damage to alfalfa and vegetables. An infestation of about fifteen grasshoppers to the square yard appeared to be necessary to cause noticeable damage. In the infested areas the grasshoppers were computed to number from twenty to thirty to the square yard." Observations and the examination of stomach contents showed the following species of birds to be feeding upon grasshoppers: *Agelaius phoeniceus californicus*, *Sturnella neglecta*, *Euphagus cyanocephalus*, *Icterus bullocki*, *Tyrannus verticalis*, *Lanius ludovicianus gambeli*, *Passer domesticus*, *Speotyto cunicularia hypogæa*, *Oxyechus vociferus*, *Butorides virescens anthonyi*, *Sayoris nigricans*, *Otocoris*

alpestris actia, *Agelaius tricolor*, *Petrochelidon lunifrons lunifrons*.

"The efficiency of the different species, when determined by destructive capacity, showed the burrowing owl to be the ablest destroyer; when determined by the numbers of individual birds in the territory, showed blackbirds, meadowlarks, killdeers, orioles, and shrikes to take positions in the order named.

"Birds cannot be considered a dependable means of control of all grasshopper epidemics, but can be inferred to be efficient in the prevention of many" and "can be depended on to act as defenders and protectors of crops because of their warfare against grasshoppers, and their value in this regard can be estimated in dollars and cents."

"Birds flocked to areas where grasshoppers were abundant" and "changed their feeding habits and fed on grasshoppers, the insect most available in this case."

Mr. Bryant concludes that while birds fail to check an insect outbreak they do constantly act as a regulative agent under ordinary circumstances when no artificial means of control are employed; and that some species which may do some damage to crops at ordinary times will be of great service during an insect epidemic, and thus offset the damage at other times. We welcome papers of this sort, dealing with concrete cases. Such intensive studies should be pressed in every state.

L. J.

A Systematic List of the Birds of California. By Joseph Grinnell. Cooper Ornithological Club, Pacific Coast Avifauna Number 8. Contributions from the Museum of Vertebrate Zoölogy of the University of California. Hollywood, California. Published by the Club, August 30, 1912. Edited by Joseph Grinnell and Harry S. Swarth at the Museum of Vertebrate Zoölogy, University of California.

The writer does not feel competent to pass judgment upon the scheme of classification here given for the birds which occur in the state of California. The task of constructing a classification which represents more nearly what practically all ornithologists the world over consider a more nearly natural arrangement than that adopted and adhered to by the A. O. U., and which must necessarily differ from it, is a somewhat thankless one. Such a classification cannot be adopted and consistently used in one part of the country without throwing into confusion hardly less than the confusion which prevailed before the present A. O. U. arrangement was adopted for North America, the work of this continent. If, as we believe, this scheme of classification is put forward as a contribution to the subject of classification and will serve to accelerate the work of the A. O. U. committee upon classification,